

# Claims

- [c1] An integrated circuit structure comprising:
  - a carrier;
  - a device connected to said carrier;
  - solder connectors electrically connecting said device to said carrier;
  - a compressible film surrounding sides of said solder connectors; and
  - an insulating material filling gaps between said carrier and said device.
- [c2] The structure in claim 1, wherein said compressible film is stable above the melting point of said solder connectors.
- [c3] The structure in claim 1, wherein said compressible film has sufficient compressibility to accommodate expansion of said solder connections when said solder connections are melted without damaging said insulating material.
- [c4] The structure in claim 1, wherein said compressible film forms a pattern between said carrier and said device.
- [c5] The structure in claim 4, wherein said pattern has channels between said device and said carrier, wherein said

channels are filled with said insulating material.

- [c6] The structure in claim 4, wherein said pattern comprises diagonal stripes of said compressible film.
- [c7] The structure in claim 4, wherein said pattern comprises rectangles of said compressible film.
- [c8] An integrated circuit structure comprising:
  - a carrier;
  - a device connected to said carrier;
  - lead-free connectors electrically connecting said device to said carrier;
  - a compressible film surrounding sides of said lead-free connectors; and
  - an insulating underfill filling gaps between said carrier and said device.
- [c9] The structure in claim 8, wherein said compressible film is stable above the melting point of said solder connectors.
- [c10] The structure in claim 8, wherein said compressible film has sufficient compressibility to accommodate expansion of said lead-free connections when said lead-free connections are melted without damaging said underfill.
- [c11] The structure in claim 8, wherein said compressible film

forms a pattern between said carrier and said device.

- [c12] The structure in claim 11, wherein said pattern has channels between said device and said carrier, wherein said channels are filled with said underfill.
- [c13] The structure in claim 11, wherein said pattern comprises diagonal stripes of said compressible film.
- [c14] The structure in claim 11, wherein said pattern comprises rectangles of said compressible film.
- [c15] A method of forming an integrated circuit structure, said method comprising:
  - forming solder connectors on a device;
  - surrounding sides of said solder connectors with a compressible film;
  - connecting said device to a carrier, wherein said solder connectors electrically connect said device to said carrier; and
  - filling gaps between said carrier and said device with an insulating material.
- [c16] The method in claim 15, further comprising melting said solder connectors, wherein said compressible film is stable above the melting point of said solder connectors.
- [c17] The method in claim 15, further comprising melting said

solder connectors, wherein said compressible film has sufficient compressibility to accommodate expansion of said solder connections when said solder connections are melted without damaging said insulating material.

[c18] The method in claim 15, wherein said process of surrounding sides of said solder connectors with said compressible film forms said compressible film into a pattern between said carrier and said device.

[c19] The method in claim 18, wherein said pattern has channels between said device and said carrier, wherein said channels are filled with said insulating material.

[c20] The method in claim 18, wherein said pattern comprises diagonal stripes of said compressible film.

[c21] The method in claim 15, wherein said process of surrounding sides of said solder connectors with said compressible film positions said compressible film partially up sides of said solder connections.

[c22] A method of forming an integrated circuit structure, said method comprising:  
forming lead-free connectors on a device;  
surrounding sides of said lead-free connectors with a compressible film;  
connecting said device to a carrier, wherein said lead-

free connectors electrically connect said device to said carrier; and  
filling gaps between said carrier and said device with an insulating underfill.

[c23] The method in claim 22, further comprising melting said solder connectors, wherein said compressible film is stable above the melting point of said solder connectors.

[c24] The method in claim 22, further comprising melting said lead-free connectors, wherein said compressible film has sufficient compressibility to accommodate expansion of said lead-free connections when said lead-free connections are melted without damaging said underfill.

[c25] The method in claim 22, wherein said process of surrounding sides of said lead-free connectors with said compressible film forms said compressible film into a pattern between said carrier and said device.

[c26] The method in claim 25, wherein said pattern has channels between said device and said carrier, wherein said channels are filled with said underfill.

[c27] The method in claim 25, wherein said pattern comprises diagonal stripes of said compressible film.

[c28] The method in claim 22, wherein said process of sur-

rounding sides of said solder connectors with said compressible film positions said compressible film partially up sides of said solder connections.